

Appl. No 10/743, 641
Amdt. Dated April 13, 2007
Reply to Office action of December 13, 2006

ARGUMENTS/REMARKS

This communication is responsive to the Office Action dated December 13, 2006. The claims have been amended to address certain rejections made by the Examiner.

Claims 1-55 remain pending.

The Office Action

In the Office Action of December 13, 2006, the Examiner made the following rejections:

Claims 2-9, 11-18, 20, 21, 31, 34-46, 38, 42-44 and 50 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Claims 1, 4, 5, 11-13, 16 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Hirano et al (U.S. Patent No. 5,028,495).

Claims 1, 4, 5, 11-13, 16 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Jha et al (U.S. Patent No. 5,553,770).

Claims 1-3, 7, 8, 10-13, 16, 19, 20, 22, 25, 26, 29 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Mennucci (U.S. Patent No. 5,761,799).

Claims 1, 4, 5, 10, 11-16 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Galasso et al (U.S. Patent No. 4,034,454).

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Claims 1-30, 34-46, 49, 50 and 53-55 were rejected under 35 U.S.C. §102 (b) as being anticipated by Hirano et al (JP 4-006173).

Claims 32, 33, 47, 48, 51 and 52 were objected to as being dependent upon a rejected base claim but otherwise identified as being allowable.

Claims 31 was identified as being allowable if amended to overcome the rejection under 35 U.S.C. §112, second paragraph.

The Rejections Under 35 U.S.C §112

Claims 2-9, 11-18, 20, 21, 31, 34-46, 38, 42-44 and 50 were rejected under 35 U.S.C. §112, second paragraph, as the examiner maintains that the term "commercially pure" is unclear since it can change over time.

In the prior response, Applicants submitted that the materials used in the invention are to be as pure as whatever is commercially available. Should higher purity materials become available than what was known at the time of the invention, then those materials would be preferred over what was commercially available at the present time and would work just as well as the presently available commercial materials.

In addition to the above, Applicants would like to note that a quick search on the USPTO's online database revealed at least 137 issued U.S. patents with the term "commercially pure" in the claims. This includes U.S. Patent No. 6,783,870, assigned to the applicant of the present application (Engineered Material Solutions).

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Again, the intent is to use material which has a purity level that is as high as commercially available. Applicants believe that this is clear and definite within the meaning of 35 U.S.C. §112, second paragraph and supported by the issuance of a number of U.S. patents with the exact same language, including one to the present applicant.

In view of the above, withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

Claim 16 was rejected under 35 U.S.C §112, second paragraph, as the examiner indicated that the term "cold rolling" did not appear in claim 11 from which claim 16 depends. Applicants have now amended claim 16 to recite "roll bonding" which finds support in claim 11. As such, withdrawal of the rejection of claim 16 is respectfully requested.

Claim 42 was rejected under 35 U.S.C §112, second paragraph, as the examiner indicated that it was unclear what was meant by "the other of copper and nickel". Applicants submit that the terminology is clear. When, for example, the first metallic layer is "copper", then the third metallic layer is "nickel" (which is the "other" of the two not used for the first layer). Likewise with the material for the forth and sixth layers. Applicants believe this is clear and definite. However, in an attempt to address the Examiner's concern, Applicants have now amended claim 42 to recite closed language for the materials from which each layer is made and requires that when the first layer is made from a material selected from the group consisting of copper or nickel then the third layer is made from the other material selected from the group consisting of copper or nickel. The same amendment was made for layers four and six in claim 42.

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Applicants believe that the above comments and amendments fully address the rejections under 35 U.S.C §112, second paragraph. Reconsideration and withdrawal of the rejections are therefore respectfully requested.

The Rejections Under 35 U.S.C §102(b)

Claims 1, 4, 5, 11-13, 16 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Hirano et al (U.S. Patent No. 5,028,495). Further, claims 1, 4, 5, 11-13, 16 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Jha et al (U.S. Patent No. 5,553,770). Also, claims 1, 4, 5, 10, 11-16 and 34 were rejected under 35 U.S.C. §102 (b) as being anticipated by Galasso et al (U.S. Patent No. 4,034,454).

Applicants would like to address the above three references of Hirano et al, Jha et al and Galasso et al as all three references require a heat treatment step of the material. The products of the invention which result from a roll bonding process without any intermediate heat treatment step are not the same as those produced from processes which utilize a heating step.

Specifically, roll bonding of metal layers to Ti (and/or Zr) requires cold working and thus hardens the strip. As disclosed in the specification, roll bonding is typically carried out in a bonding mill that provide sufficient pressure to form a metallurgical bond without heat treating (such as annealing, for example) between dissimilar metals. It is common metal working practice to put the

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cold worked strip through an annealing process to soften it up for any further cold rolling. The annealing requires time at elevated temperatures and usually requires a protective atmosphere to avoid forming surface scales. The annealing process conditions that is likely to apply to the strip have two problems that will cause strip to become brittle and is not able to be further cold rolled to the foil gauge for brazing filler application. The time and temperature will cause interdiffusion between Ti/Zr and Cu/Ni layers. The resultant intermetallic compounds between Ti/Zr and Cu/Ni are extremely brittle and will crack between layers under the cold rolling condition. The second issue is the gas used as the protective atmosphere. The commonly used gas is either nitrogen or hydrogen or a mixture of nitrogen and hydrogen, which will be absorbed into the Ti/Zr and cause embrittlement. This will also render the strip unworkable. In summary, there are many metallurgical reasons that this clad strip can not be processed with conventional rolling and annealing practices. On the other hand, by cladding layers to the surfaces of Ti or Zr without an intermediate heating step, we are able to roll the clad strip to far more thickness reduction than what is possible on the Ti or Zr by itself or when clad with materials using an intermediate heating step.

Moreover, the Examiner is ignoring the limitation that the final "brazing strip or foil" is complete upon roll bonding without need for further treatment as instructed by the cited art. As such, it is our position that the prior art actually teaches away from the invention by including additional heat treatment steps and not recognizing that such steps are not required or encompassed by the current claims to produce the claimed brazing strip/foil.

In view of the above, the references of Hirano et al, Jha et al and Galasso et al do not teach the material of the invention as the heating steps used to prepare these products result in a clad material which is not the same as the claimed material which is made by a process which does not include any intermediate heating. As such, Hirano et al, Jha et al and Galasso et al do not anticipate the designated claims and the rejections should be withdrawn.

Claims 1-3, 7, 8, 10, 11-13, 16, 19, 20, 22, 25, 26, 29 and 34 were rejected under 35 U.S.C §102 (b) as being anticipated by Mennucci (U.S. Patent No. 5,761,799).

The process of Mennucci et al required inclusion of platinum stripes (item no 15) to the surface of a copper layer which is to be bonded to a titanium base material. No such platinum stripes are present in the material of the invention. As such, the material of Mennucci et al is not the same as the material of the invention. Moreover, the product of Mennucci is not a brazing strip or foil but rather a laminate which is essentially a platinum coated titanium strip useful as anodes in chemical processing or in electrical conductor applications. No mention is made of using the platinum coated materials as brazing strips or foils. As such, Mennucci fails to anticipate the claims under 35 U.S.C. §102 (b). Withdrawal of the rejection is respectfully requested.

Claims 1-30, 34-45, 48, 49 and 52-54 were rejected under 35 U.S.C §102 (b) as being anticipated by Hirano et al (JP 4-006173).

With respect to Hirano et al (JP), no mention is made of any metallic bond being present between layers, muchless that the bond was formed solely by roll bonding the materials together without any intermediate heating step. As discussed above, materials of the invention which contain a Ti or Zr core material which are produced without the intermediate heating are materially different from those produced in a process which utilizes some heating. While Hirano teaches "coating" a Zr base with a special Cu/Ti/Ni-Cu composite, rolling and **annealing** are required as seen in the translation at pages 6 and 7. Again, the claims of the present invention specifically require the absence of any intermediate heat treating (i.e. annealing is a heat treatment) prior to forming the final brazing strips or foils. Thus a reference which teaches some heating step prior to formation of the finished product does exactly what the claims exclude.

Moreover, the claims of the present invention require only one core, either Zr, Ti or a blend of Zr and Ti. The material of Hirano et al has a Zr core and then a material having a second Ti core (the Cu/Ti/Ni-Cu) material. This is not the same as the invention. As such, Claims 1-30, 34-45, 48, 49 and 52-54 are not anticipated by the Hirano et al (JP) reference. Withdrawal of the rejection is therefore respectfully requested.

Conclusion


In consideration of the foregoing analysis, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the examiner is invited to initiate

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a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. 34180US2.

Respectfully submitted,
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